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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,933	08/28/2003	Edward D. Tate JR.	GP-301753	8067
7590	12/10/2004		EXAMINER	
CHRISTOPHER DEVRIES General Motors Corporation, Legal Staff Legal Staff, Mail Code 482-C23-B21 P.O. Box 300 Detroit, MI 48265-3000			TIBBITS, PIA FLORENCE	
			ART UNIT	PAPER NUMBER
			2838	
			DATE MAILED: 12/10/2004	

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/650,933	TATE ET AL.
	Examiner Pia F Tibbits	Art Unit 2838

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 24 November 2004.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 and 13-19 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 7-9 and 12 is/are rejected.
- 7) Claim(s) 10 and 11 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date 8/28/03.
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_ .
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_

**DETAILED ACTION**

This Office action is in answer to the election response filed 11/24/2004. Claims 1-19 are pending, of which claims 7-12 were elected.

1. Applicant's election of Group II, claims 7-12, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse. **MPEP 818.03** (a) states that "As shown by the first sentence of 37 CFR 1.143, the traverse to a requirement must be complete as required by 37 CFR 1.111(b) which reads in part: "In order to be entitled to reconsideration or further examination, the applicant or patent owner must reply to the Office action. The reply by the applicant or patent owner must be reduced to a writing which distinctly and specifically points out the supposed errors in the examiner's action and must reply to every ground of objection and rejection in the prior Office action. The applicant's or patent owner's reply must appear throughout to be a bona fide attempt to advance the application or the reexamination proceeding to final action."

***Claim Objections***

2. Claim 1 is objected to because of the following informalities: "modeling said battery with a linear equation" is not correct since battery measured variables are modeled, and not the battery. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9: "a synthesized input" is not clear since the specific input is not defined.

***Claim Rejections - 35 USC § 103***

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5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 7, 8, 12 are rejected under 35 U.S.C. 103(a) as being obvious over prior art disclosed by applicant, **Verbrugge et al.** [hereinafter Verbrugge][6359419] in view of **Tate, Jr. et al.** [hereinafter Tate] [6441586].

The applied references have a common assignee and a common inventor with the instant application. This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Verbrugge discloses a method of estimating a state of charge of a battery SOC comprising measuring a terminal current of said battery/SOC<sub>C</sub> [see abstract, column 4, lines 35-40], measuring a terminal voltage of said battery/SOC<sub>N</sub> [see abstract, column 4, lines 40-41];, and processing said measurements in an equation through a time-varying state estimator based on said terminal current and

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said terminal voltage [see column 4, lines 7, 45-48; column 7, to determine said state of charge SOC. Verbrugge does not disclose modeling said battery with a linear equation and processing said linear equation.

Tate discloses a method of optimizing a SOC estimation by using a Kalman Filter to linearize non-linear systems and update the state estimate [see also column 3, lines 18-30; column 11, lines 63-65; column 12, lines 16-21; column 14, lines 33-51]. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Verbrugge's method and include a Kalman Filter to linearize non-linear systems and update the state estimate, as disclosed by Tate, in order to optimize a SOC estimation of the battery charge state.

As to claim 8, see remarks for claim 7.

As to claim 12, Verbrugge discloses in that alternate embodiments of his invention, the battery pack 16 may comprise any known battery technology, including but not limited to lead acid [see column 3, lines 29-31].

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

***Allowable Subject Matter***

8. Claims 10 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With respect to claims 10 and 11: none of the references of record prior to applicant's filing date discloses, teaches, or suggests a method of estimating a state-of-charge of a battery comprising, *inter alia*, a step of processing a linear equation that comprises predicting a current state-of-charge based on a prior state-of-charge, predicting a current state-of-charge error based on a prior state-of-charge error; determining a current gain based on said current state-of-charge error; and updating said current state-of-charge based on said prior state-of-charge to provide said state-of-charge of said battery.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The prior art cited in PTO-892 and not mentioned above disclose related apparatus: **Grewe et al.** [20020024221], [6417577], [6239502] discloses **synthesizing** the electrical drive waveforms in order to provide improved efficiency and performance by comparison with simple on-off application of the raw source energy, voltage and current of a lead acid battery for an electrical vehicle. **Bertness** [6441585], [6332113] [5945829] discloses an apparatus and method for testing rechargeable energy storage batteries where data are synthesized. **Gephart et al.** [4709318] discloses a voltage synthesizer for a UPS line supply. **Finger et al.** [4193026] discloses a method and apparatus for measuring the state of charge of a battery by monitoring reductions in voltage where a plurality of threshold detectors may also be used to **synthesize** any desired response by the selection of various thresholds and various electrical outputs for each of the plurality of threshold detectors.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Pia Tibbits whose telephone number is (571) 272-2086. If unavailable, contact the Supervisory Patent Examiner Mike Sherry whose telephone number is (571) 272-2084. The Technology Center Fax number is (703) 872-9306.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from

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either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PFT

December 2, 2004

Pia Tibbits

Primary Patent Examiner

